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A novel secreted ribonuclease from Bacillus intermedius: Gene structure and regulatory control

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Abstract

A second secreted ribonuclease, designated binase II, has been detected in Bacillus intermedius 7P, and its structural gene was cloned and sequenced. Unlike the well-known binase I, a 109-amino acid guanyl-specific enzyme, the 292-residue binase II is closely related to the B. subtilis nuclease Bsn, in structure and in its enzymatic properties. Binase II is also insensitive to inactivation by barstar, an inhibitor protein that is specific for guanyl-specific ribonucleases. While both B. intermedius enzymes are induced upon phosphate starvation, only the gene for binase I belongs to the pho regulon system and carries pho-box elements adjacent to its promoter sequence. The gene for binase II is similar to that for Bsn in lacking such elements. The birB gene coding for binase II appears to be located next to the 3'-end of a ferric ion transport operon, with which it convergently overlaps. This would allow attenuator control over binase II expression under conditions of starvation for ferric ions.

Keywords

Ferric ion transport, Phosphate starvation, RACE analysis Attenuation, Ribonuclease secretion